Instant Broadband™ Series

EtherFast Cable/DSL Router

Model No.: **BEFSR41**

User Guide

LINKSYS®

LIMITED WARRANTY
Linksys guarantees that every Instant Broadband EtherFast Cable/DSL Router is free from physical defects in material and workmanship under normal use for one (1) year from the date of purchase. If the product proves defective during this warranty period, call Linksys Customer Support in order to obtain a Return Authorization number. BE SURE TO HAVE YOUR PROOF OF PURCHASE ON HAND WHEN CALLING. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE. When returning a product, mark the Return Authorization number clearly on the outside of the package and include your original proof of purchase.

IN NO EVENT SHALL LINKSYS' LIABILITY EXCEED THE PRICE PAID FOR THE PRODUCT FROM DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT, ITS ACCOMPANYING SOFTWARE, OR ITS DOCUMENTATION. Linksys makes no warranty or representation, expressed, implied, or statutory, with respect to its products or the contents or use of this documentation and all accompanying software, and specifically disclaims its quality, performance, merchantability, or fitness for any particular purpose. Linksys reserves the right to revise or update its products, software, or documentation without obligation to notify any individual or entity. Please direct all inquiries to:

Linksys P.O. Box 18558, Irvine, CA 92623.

FCC STATEMENT
The Instant Broadband EtherFast Cable/DSL Router has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or device
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

Table of Contents

Introduction

The Linksys EtherFast Cable/DSL Router

Congratulations on your purchase of a Linksys Instant Broadband EtherFast Cable/DSL Router. The EtherFast Cable/DSL Router is the perfect option to connect a small group of PCs to a high-speed Broadband Internet connection or to an Ethernet backbone. Configurable as a DHCP server, the EtherFast Cable/DSL Router acts as the only externally recognized Internet device on your local area network (LAN). The Router serves as an Internet firewall, protecting your network from being accessed by outside users. All incoming data packets are monitored and filtered. The router can also be configured to block internal users' access to the Internet.

Unlike a typical router which can only share 10Mbps over all its connections, the Linksys EtherFast Cable/DSL Router is equipped with a blazing 4-port EtherFast Switch, dedicating a full 100Mbps to each and every connected PC. Not only will all of your PCs now be able to enjoy your lightening-fast Broadband Internet connection, they will also be able to share internal network data faster than ten times the Broadband Internet speed. Add it all together and your small network will hum along faster than you ever thought possible.

Features

- Connects to a Broadband modem or to an Ethernet backbone.
- Equipped with a 4-port 10/100 Switch.
- Connects all of your PCs to the Internet with only one purchased IP address.
- Creates a firewall to protect your PCs from outside intruders.
- Configurable through any networked PC's web browser using Netscape or Internet Explorer 4.0 or higher.
- The switch dramatically speeds up your gaming and multimedia connections.
- Can act as both a DHCP Server and a DHCP Client at the same time.
- Compatible with virtually all standard Internet applications.
- Administrators can block specific interior users' Internet access.*
- DMZ Host option provides unrestricted two-way communication between one PC and your Internet services.*

***Note**: *The setup of the EtherFast Cable/DSL Router's advanced features is the sole responsibility of the user. Linksys does not offer technical support for the Router's advanced features unless otherwise noted in the User Guide.*

Package Contents

- One Linksys Instant Broadband Cable/DSL Router
- One power adapter and power cord
- One user guide and registration card

System Requirements

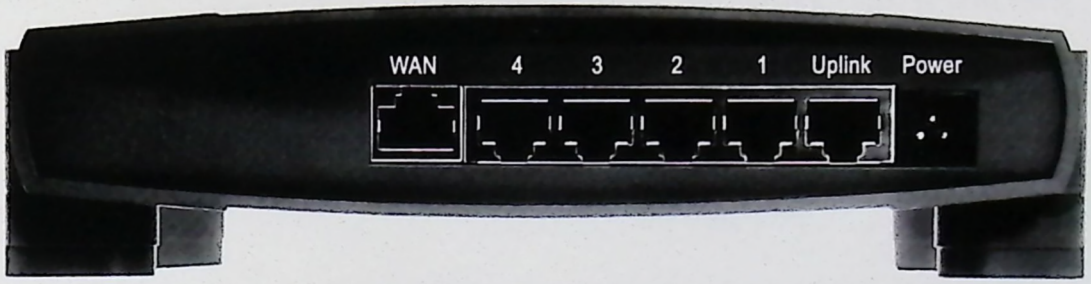
PC Requirements

- One RJ-45 Broadband Internet connection
- One PC with an installed 10Mbps, 100Mbps, or 10/100 Mbps Ethernet card
- TCP/IP network protocol for each PC
- UTP network cable with RJ-45 connector
- Microsoft Internet Explorer 4.0 or later, or Netscape Navigator 4.0 or later

Getting to Know the EtherFast Cable/DSL Router

Rear Panel

The rear panel of the Router is where all of the Router's connections are made.



The Router's Ports

WAN

The WAN (Wide Area Network) Port is where you will connect your cable or DSL modem.

Uplink

The Uplink Port is where you can expand your network by connecting to another switch or hub. The Uplink Port is shared with Port 1. Uplinking to another Router, switch or a hub is done by simply running a cable from the Uplink Port to the device.

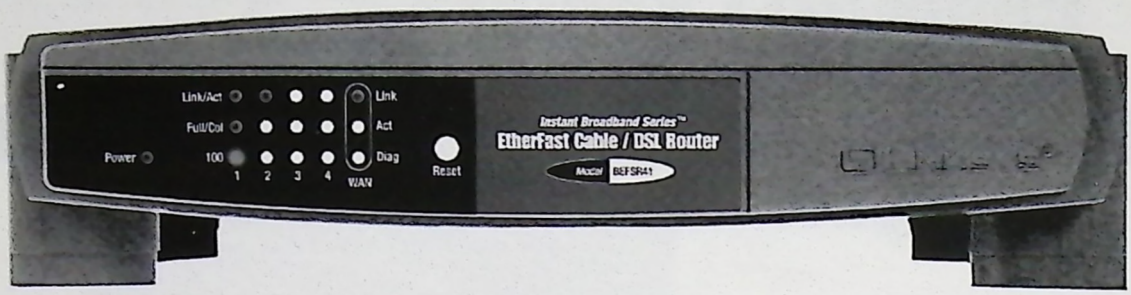
Ports 1-4

These four LAN (Local Area Network) ports are where you will connect networked devices, such as PCs, print servers, remote hard drives, and anything else you want to put on your network.

Power

The Power Port is where you will connect the included AC Power adapter.

Front Panel LEDs



The LAN Indicators

Power — *Green*. The Power LED illuminates when the Router is powered on.

Link/Act — *Green*. The Link/Act LED serves two purposes. If the LED is continuously illuminated, the Router is successfully connected to a device through the corresponding port (1, 2, 3 or 4). If the LED is flickering, the Router is actively sending or receiving data over that port.

Full/Col — *Green*. The Full/Col LED also serves two purposes. If this LED is continuously illuminated, the connection made through the corresponding port is successfully running in Full Duplex mode. If the LED is flickering, the connection is experiencing collisions. Infrequent collisions are normal. If this LED is flickering too often, there may be a problem with your connection. Check the Troubleshooting section on page 26 if you think there is a problem.

100 — *Orange*. The 100 LED illuminates when a successful 100Mbps connection is made through the corresponding port.

The WAN Indicators

Link *Green*. The Link LED illuminates when a successful connection is made between the Router and your Broadband device or network.

Act *Green*. The Act LED flickers when the Router is sending or receiving data over the broadband port.

Diag *Red*. The Diag LED illuminates when the Router goes through its self-diagnosis mode during boot-up. It will turn off upon successful completion of the diagnosis. If this LED stays on for an abnormally long period of time, refer to Troubleshooting on page 26.

The Reset Button

Briefly pressing the Reset Button will refresh the Router's connections, potentially clearing any jammed links.

Pressing the Reset Button and holding it in for a few seconds will clear all of the Router's data. This should be done only if you are experiencing heavy routing problems, and only after you have exhausted all of the other troubleshooting options. By resetting the Router, you run the risk of creating conflicts between your PCs' actual IP Addresses and what the Router thinks their IP Addresses should be. You may be forced to reboot the entire system(s).

If your router locks up, simply power it down for 3 to 5 seconds by removing the power cable from the Router's Power Port. Leaving the power off for too long could result in the loss of network connections.

Connecting the Cable/DSL Router to Your Network

Overview

Unlike a simple hub or switch, the setup of the Cable/DSL Router consists of more than simply plugging everything together. Because the Router acts as a DHCP server, you will have to set some values within the Router, and also configure your networked PCs to accept the IP Addresses the Router chooses to assign them.

You will need the following values from your ISP in order to install the Cable/DSL Router:

- Your broadband-configured PC's fixed Internet IP Address (if applicable)
- Your broadband-configured PC's Computer Name and Workgroup Name
- *Your Subnet Mask*
- *Your Default Gateway*
- *Your Primary DNS IP address*

} *Only if applicable*

Whoever installed your broadband access should have left this information with you. If not, call your ISP and they will be able to supply you with it.

About Static & Dynamic IP Addresses

Static IP Addresses A static IP address is an IP address permanently assigned to computer in a TCP/IP network. Static IP addresses are usually assigned to networked devices which are consistently accessed by multiple users, such as Server PCs, or printers. If you are using your Router to share your cable or DSL Internet connection, contact your ISP to see if they have assigned your home a static IP address. You will need that address during your Router's configuration.

Dynamic IP Addresses A dynamic IP address is an IP address that is automatically assigned to a client station (computer, printer, etc.) in a TCP/IP network. Dynamic IP addresses are typically assigned by a DHCP server, which can be a computer on the network or another piece of hardware, such as the Router. A dynamic IP address may change every time your computer connects to the network.

DHCP (Dynamic Host Configuration Protocol) DHCP is software that automatically assigns IP addresses to client stations logging onto a TCP/IP network. DHCP eliminates having to manually assign permanent IP addresses to every device on your network. DHCP software typically runs in servers and is also found in network devices such as Routers.

Connecting Everything Together & Booting Up

Once you are sure that you have the above values on hand, you can begin the Installation and Setup of your Cable/DSL Router.

> ***Note:*** *Some ISPs—most notably some cable providers—configure their networks so that you do not have to enter a full Internet address into your web browser or e-mail application to reach your home page or receive your e-mail. If your Internet home page address is something very simple, such as "www", rather than "www.linksys.com", or your e-mail server's address is something similar to "e-mail" or "pop3", rather than "pop.mail.linksys.com", you won't be able to properly configure your Cable/DSL Router until you determine the actual Internet addresses of your Web and e-mail connections.*
>
> *You* ***must*** *obtain this information prior to connecting the Router to your network. You can obtain this information by contacting your ISP, or you can turn to page 29 to learn how to* ping *for an IP address.*

1. **Power everything down**, including your **PCs**, your **Cable** or **DSL** modem and the **Router**.

2. **Connect an Ethernet cable** from one of your PCs' Ethernet ports to one of the LAN Ports on the back of the Router. Do the same with all the PCs you wish to connect to the Router. (LAN Port 1 will become inactive if you use the Uplink port.)

3. **Connect the network cable** from your Cable or DSL modem to the **WAN** port on the rear of the Router.

4. **Connect the power-supply cable** to the Power port on the rear of the Router, then plug the supplied AC power cable into a power outlet. Plug the other end into the back of the power adapter.
   - The Power LED will illuminate green as soon as the power adapter is connected.
   - The Diag LED will illuminate red for a few seconds while the Router goes through its internal diagnostic test. The LED will turn off when the self-test is complete.

5. **Power on the Cable or DSL modem**.

6. **Press the Reset button** on the front of the router. Hold the button in for three seconds, or until the Diag LED illuminates red. This restores the router's default settings.

The Hardware Installation is complete. Continue to the next page to configure the router's settings.

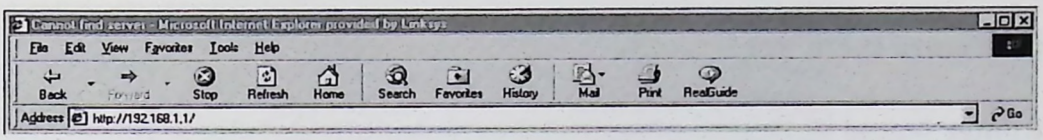
Configuring Your Network with the Cable/DSL Router

Note: *If the TCP/IP protocol is not configured on your PC, go to page 30 of the Appendix for TCP/IP installation instructions now.*

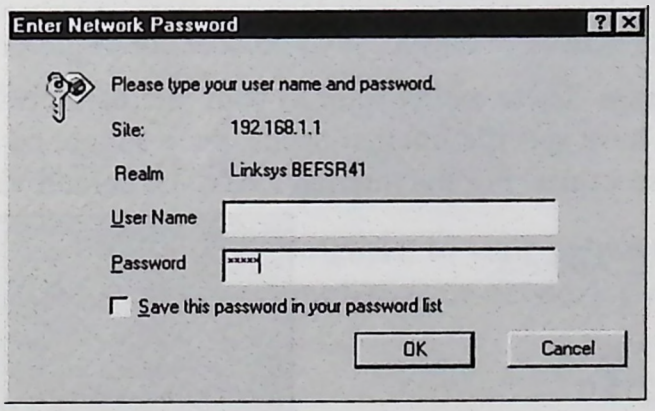
Configuring the Cable/DSL Router

Now that your Cable/DSL Router is wired into your network, you can begin configuring your system.

1. **Open your web browser** and type `http://192.168.1.1` in the browser's Address box. This number is the IP address of your router. Press **Enter**.



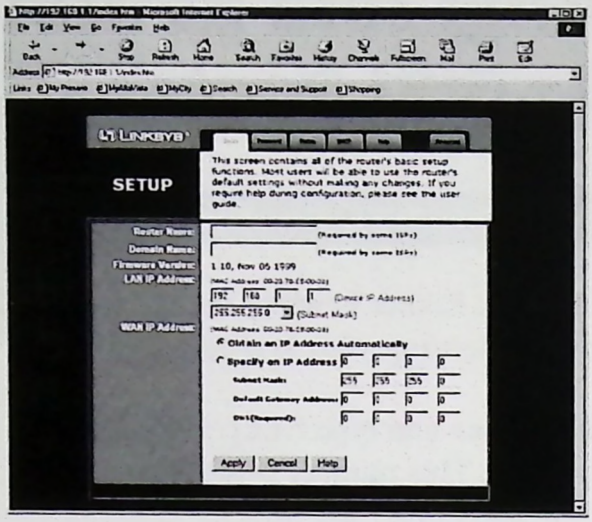
2. **A username and password prompt** will appear. Leave the User Name box empty and type `admin` (the default password) in the **Password** box. Click **OK**.



Note: *If you have previously enabled an Internet Sharing Proxy Service on any of your PCs, you must disable it now.*

- *If you are running Netscape Navigator: Click* ***Edit*** *>>* ***Preference*** *>>* ***Advanced*** *>>* ***Proxies****> and click* ***Direct Connection to the Internet****.*
- *If you are running Internet Explorer v5 or better, click* ***Start****>>* ***Settings****>>* ***Control Panel****>>* ***Internet Options****>>* ***Connections****>>* ***LAN Settings****. Check "Automatically Detect*

3. **The Cable/DSL Router's Setup page** will appear.



Note: *The setup page shown in the graphic above may differ from the one seen on your router.*

4. **Configure the following values.**

Router Name & Domain Name These fields allow you to supply a host and domain name for the Router. Some ISPs require these names as identification. You may have to check with your ISP to see if your Broadband Internet service has been configured with a host and domain name. In most cases, leaving these fields blank will work.

LAN IP Address These values refer to your internal network settings. Unless you have specific internal needs, there should be no reason to change these values. For the internal LAN, the default values are as follows.

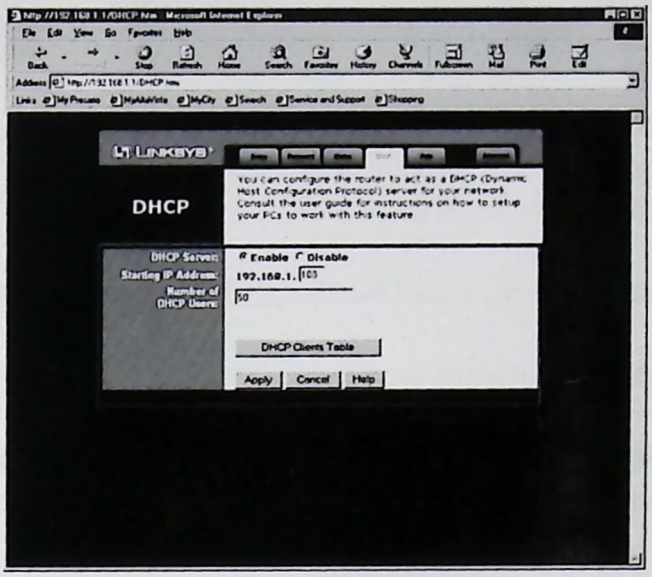
- Private IP Address: 192.168.1.1
- Subnet Mask: 255.255.255.0

Note: *If you have an existing DHCP server on your LAN and you don't wish to use the router as your new DHCP server, you must assign your router a static IP address. The router's IP address must be compatible with your existing network. You can not have two DHCP servers running on one LAN at the same time.*

WAN IP Address These values refer to the outside network you connect to every time you access your Broadband Internet connection. Most Broadband ISPs assign their clients with a different IP address each time they log on. If this is the case with your ISP, click **Obtain an IP Address Automatically** and continue to step 5. If your ISP assigns you a fixed IP address, click **Specify an IP Address** and enter the address into the **Subnet Mask, Default Gateway Address** and **DNS** fields.

5. **When you have properly configured** the Setup page, click **Apply**, then click **Continue**.

6. **Choose the DHCP tab**.



7. **Unless you already have a DHCP server** on your internal network, choose **Enable** from the *DHCP Server* field. By choosing Enable, you will configure the Router to automatically assign IP addresses to each of your PCs. In the *Number of DHCP Users* box, enter the number of PCs you plan on networking to the Router. Don't forget to change this number if, in the future, you add more PCs to your network.

8. Click **Apply**, then click **Continue**.

Your Cable/DSL Router is now configured to your network. Please continue to the following section to complete your network setup.

Configuring Your PCs to Connect to the Cable/DSL Router

Note: *Ensure that a Network Card or adapter has been successfully installed into each PC you plan on configuring prior to continuing.*

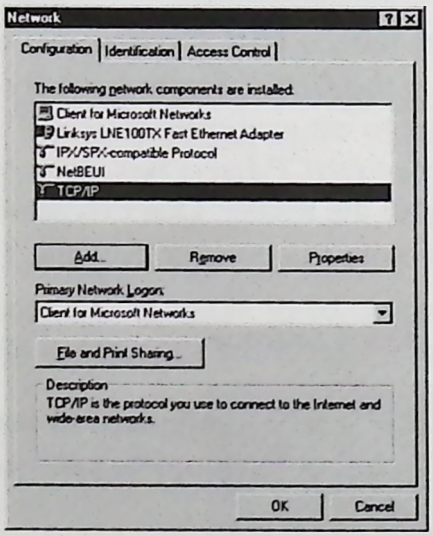
Now that your Router is configured, you will have to configure your other PCs to accept the IP addresses that your Router will provide.

These instructions apply only to Windows 95 and Windows 98 machines. For TCP/IP setup under Windows NT, please refer to your Windows NT manual.

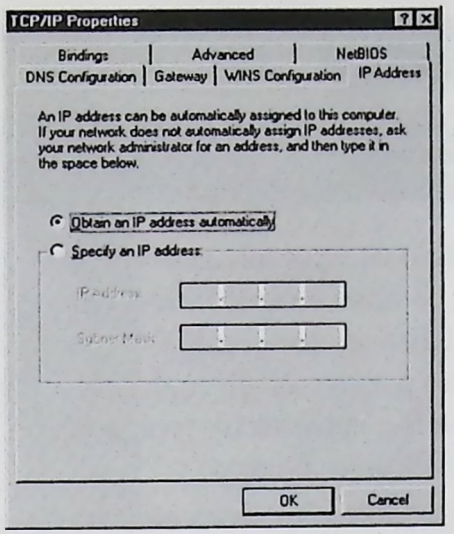
1. Click the **Start** button, select **Settings**, then **Control Panel**.

2. Double-click the **Network** icon.

3. In the **Configuration** window, select the **TCP/IP protocol line** that has been associated with your network card/adapter. If there is no TCP/IP line listed, go to page 30 to install the TCP/IP Protocol **now**.



4. Click the **Properties** tab. Select **Obtain an IP address automatically**. Press **OK**. You have completed the client settings.



5. Click **OK**. Windows may ask for original Windows installation files. Supply them as needed (i.e.: D:\win98, D:\win95, c:\windows\options\cabs.)

6. Windows will ask you to restart the PC. Click **Yes**.

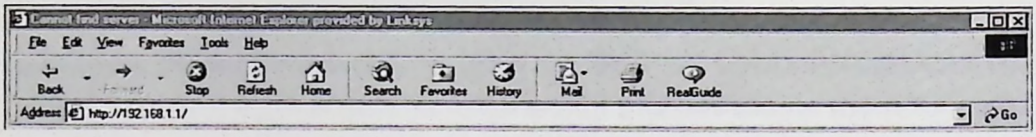
Repeat steps 1-6 for each PC on your network. When all of your PCs are configured, the Cable/DSL Router Setup and Installation is complete.

If you would like, you may continue on to learn more about the router's Web-based Utility.

The Cable/DSL Router's Web-based Utility

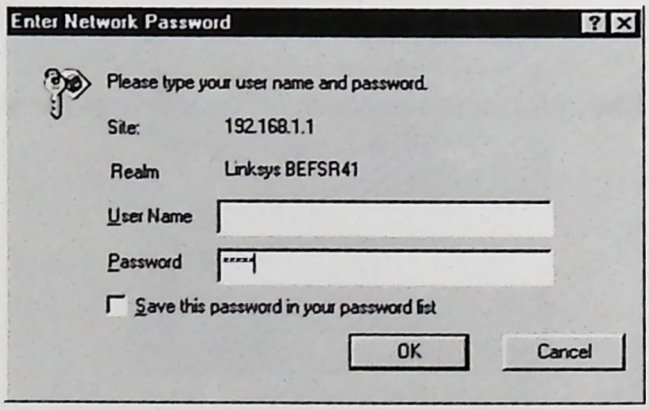
Quick & Easy Administration

The EtherFast Cable/DSL Router has an internal integrated-circuit chip but no keyboard, monitor or mouse capabilities. Because of these limitations, an administrative utility has been programmed into that chip. All router-based administrative tasks are performed through this utility. The utility can be accessed by any PC on the network by typing `http://192.168.1.1` into the PC's web browser address window.



Upon entering the address into the web browser, a password request page will pop up.

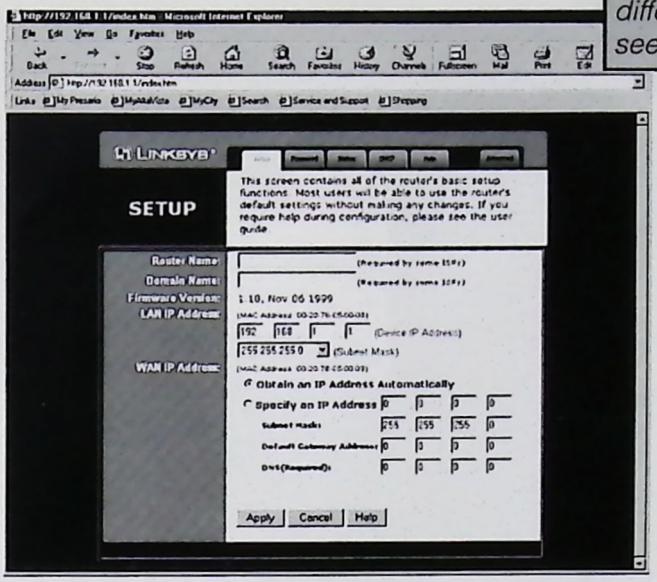
Leave the User Name field empty, but type "admin" into the Password field.



On the following pages you will find brief descriptions of each utility web-page and each page's more important functions. More detailed explanations and instructions can be found by clicking each page's **Help** button. To apply any settings you've altered on any page, click the **Apply** button, then click **Continue**. To clear any values you've entered on any page, click **Cancel**.

Setup

Note: *The Setup page shown in the graphic below may differ from the one seen on your router.*

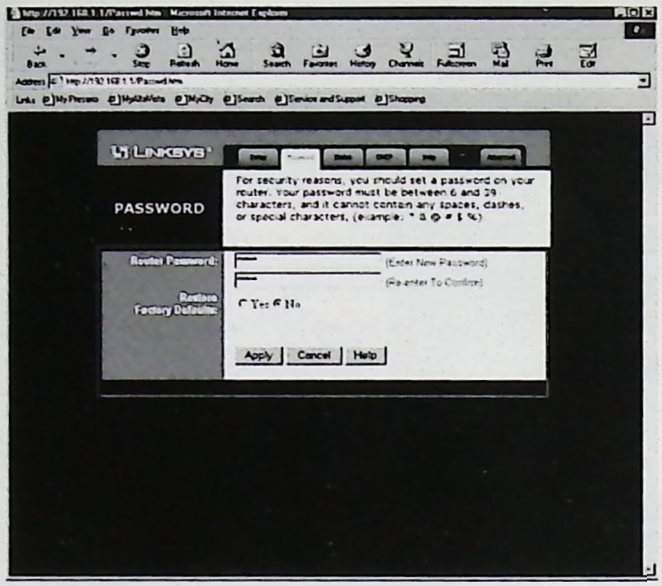


The Basic Setup screen is the first screen you will see when you access the Utility. If you have already installed and setup your router, you have already seen this screen and have already properly configured all of the screen's values.

- **Router Name** This entry is necessary for some ISPs.
- **Domain Name** This entry is necessary for some ISPs.
- **Firmware Version** This entry shows the version of the firmware you are using. Future versions of the Router's Firmware may become available on the Linksys Website.
- **LAN IP Address and Subnet Mask** The IP Address and Subnet Mask of the router as it is seen on the internal LAN. The default value is 192.168.1.1 for IP and 255.255.255.0 for Subnet Mask.
- **WAN IP Address and Subnet Mask** The IP Address and Subnet Mask of the router as seen by external users on the Internet (including your ISP). If set to Obtain an IP address automatically, these values are assigned by your ISP.
- **Default Gateway Address** Your ISP will provide you with the Gateway IP Address. If set to Obtain an IP address automatically, these values are assigned by your ISP.
- **DNS (Domain Name Server) IP Address** Your ISP will provide you with at least one DNS IP Address. If set to Obtain an IP address automatically, these values are assigned by your ISP.

You can test and see if these settings are correct by successfully connecting to the Internet.

Password

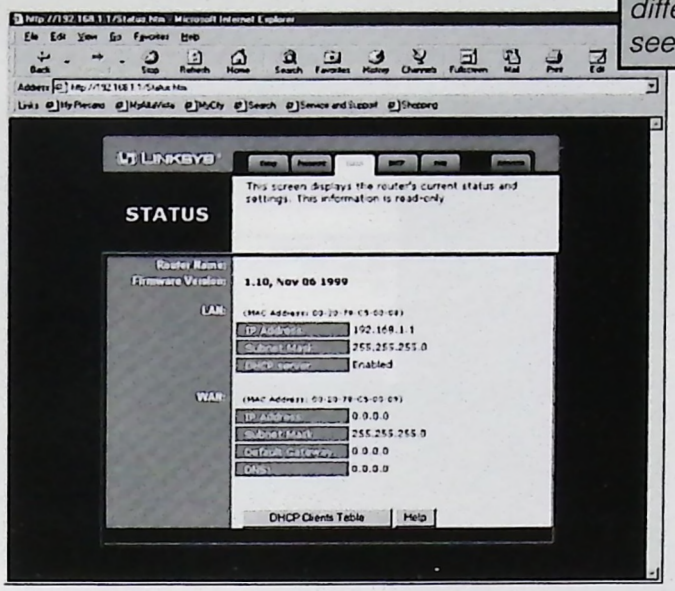


It is strongly recommended that you set a password for the router. When you first power up the router, you will notice that the Password setting has been left blank. When the password field is blank, all users on your network can access the router simply by entering the unit's IP address into their web browser's location window.

If you set the Restore Factory Default option and click Apply, you will clear all of the router's settings. Do not restore to the factory defaults unless you absolutely have to.

Status

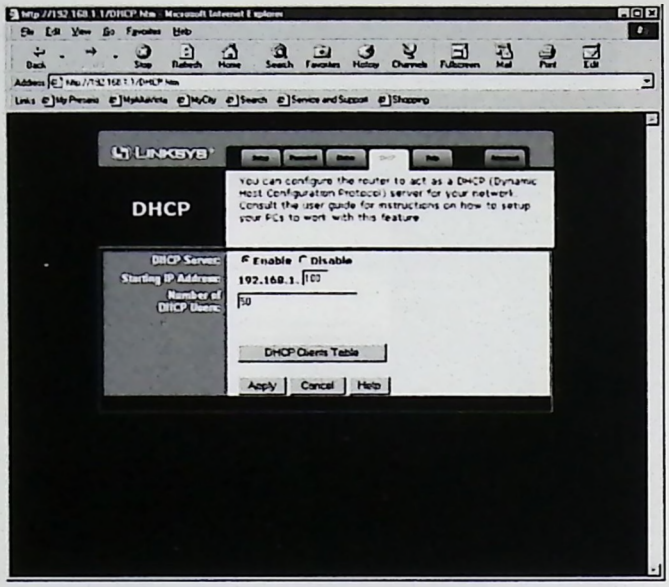
Note: *The Status page shown in the graphic below may differ from the one seen on your router.*



This screen provides the current status of the device. All of the information provided is read-only.

- **Router Name** This field shows the name of this device. This entry is necessary for some ISPs.
- **Firmware Version** This field shows the installed version of the firmware.
- **LAN** These fields display the current IP Address and Subnet Mask of the router, as seen by users on your internal network.
- **DHCP server** This field shows the status of the router's DHCP server function. This option is either enabled or disabled.
- **WAN** These fields display the IP Address, Subnet Mask and Gateway IP of the router as seen by external users on the Internet.
- **DNS (Domain Name Server) IP Address** This field shows the IP Address of the DNS currently being used. Multiple DNS IP settings are common. The first available DNS entry is used in most cases.

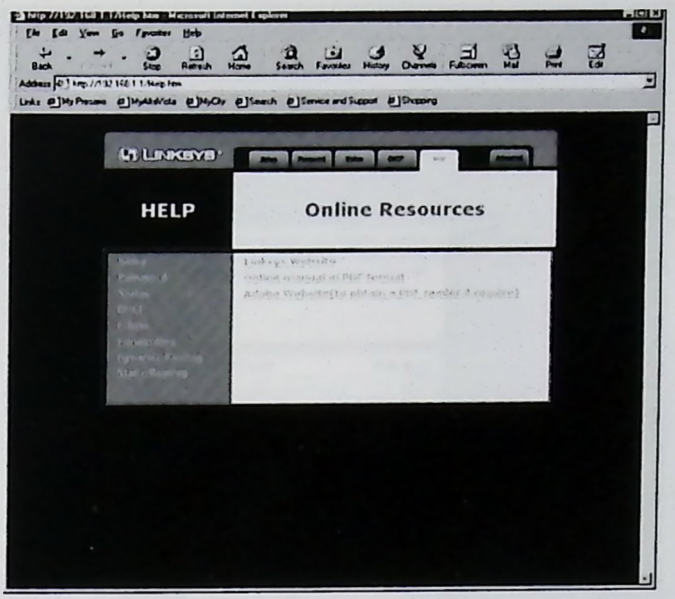
DHCP



A DHCP (Dynamic Host Configuration Protocol) Server automatically assigns IP addresses to each computer on your network. Unless you already have one, it is highly recommended that your router be set up as a DHCP server.

- **DHCP Server** Check the **Enable** option to enable the DHCP server option of the router. If you already have a DHCP server on your network, set the router's DHCP option to **Disable**.
- **Starting IP Address** Enter a numerical value for the DHCP server to start with when issuing IP addresses.
- **Number of DHCP users** Enter the maximum number of PC that you want the DHCP server to assign IP addresses to, with the absolute maximum being 253.
- **DHCP Client Table** Click on the **Client Table** button to show the current DHCP Client information.

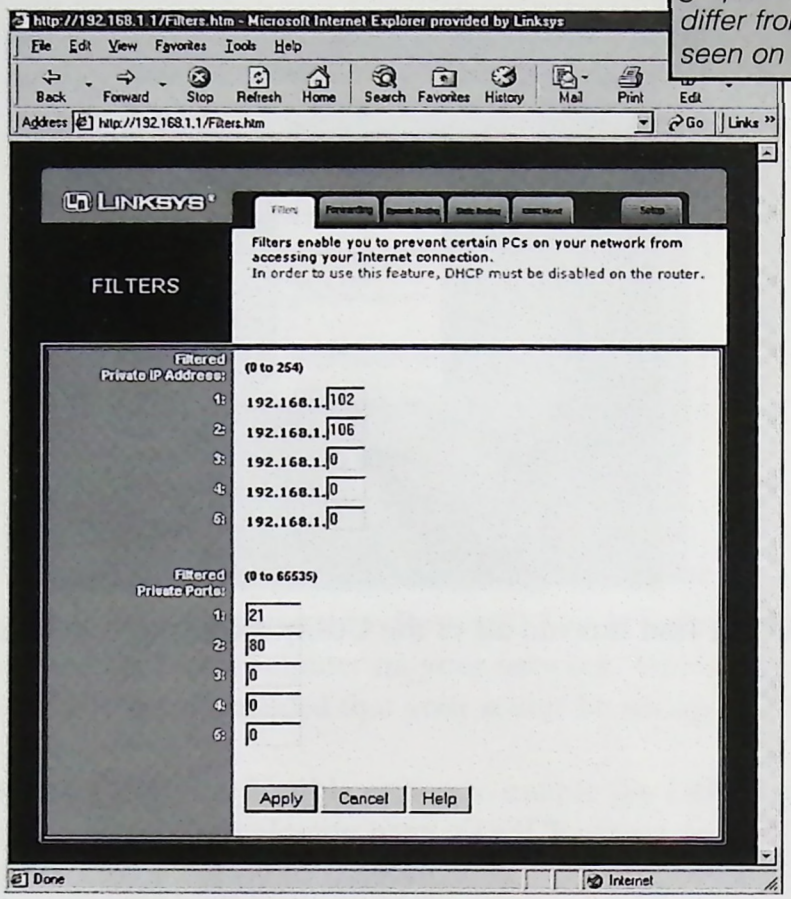
Help



Here you will find links to all of the Utility's internal support documentation.

Filters

Note: *The Filters page shown in the graphic below may differ from the one seen on your router.*



Filters block specific internal users from accessing the Internet. You can set up a filter through an IP address or a network Port number.

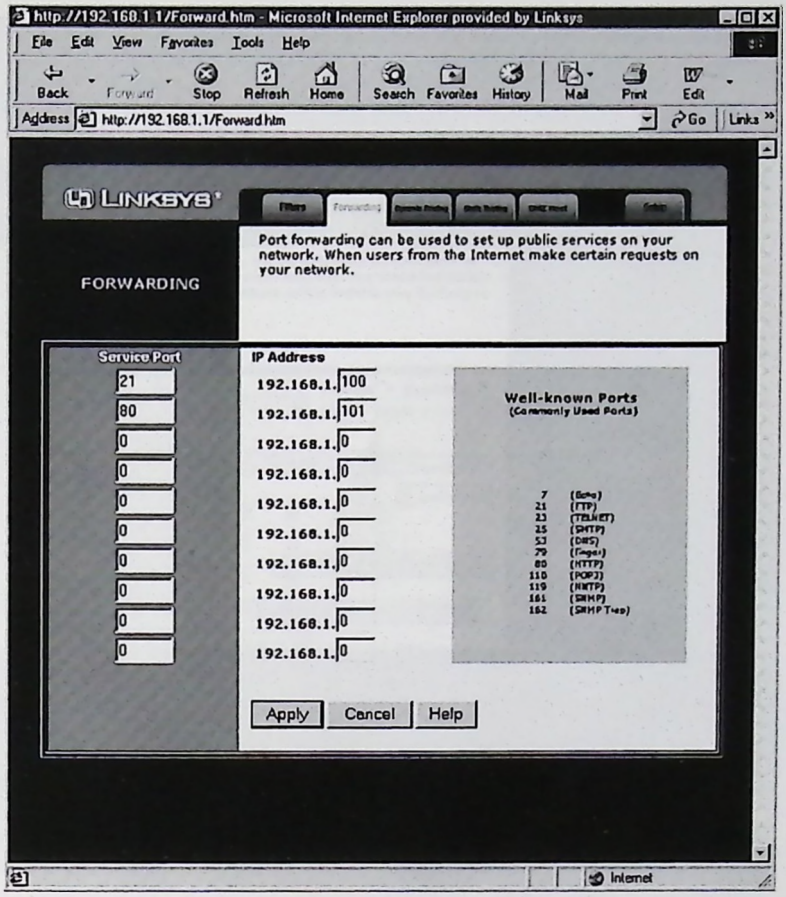
To Modify Filter Settings

- Enter the IP addresses that you want to filter into the IP address fields. The users who have these IP addresses will not be able to access the Internet.

- You can also filter users by entering their network port number. Enter the port numbers you want to filter into the port numbers fields. Users who are connected to the Router will no longer be able to access any port number listed there.

Click the Apply button to save any changes.

Forwarding



Port forwarding sets up public services on your network. When users from the Internet make certain requests of your network, the router will forward those requests to the appropriate computer. The router's DHCP function must be disabled to use Forwarding.

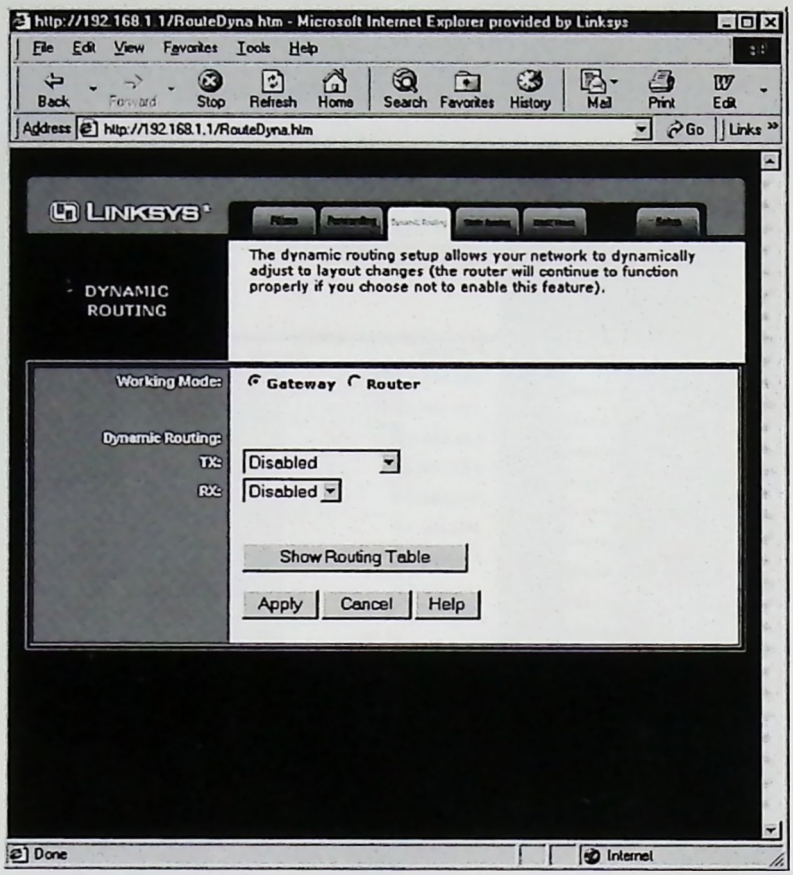
Forwarding is generally used to set up a webserver, ftp server, or e-mail server on your network. To add a server using Forwarding:

1. Enter the port number used by the server. On the same line, enter the IP Address of the server that you want the Internet users to be able to access.

2. Configure as many entries as you would like until all of the link entries are filled.

3. Click the Apply to save the settings.

Dynamic Routing



With Dynamic Routing you can automatically adjust to physical changes in the network's layout. The router, using the RIP protocol, determines the network packets' route based on the fewest number of hops between the source and the destination. The RIP protocol regularly broadcasts routing information to other routers on the network. To set up Dynamic Routing:

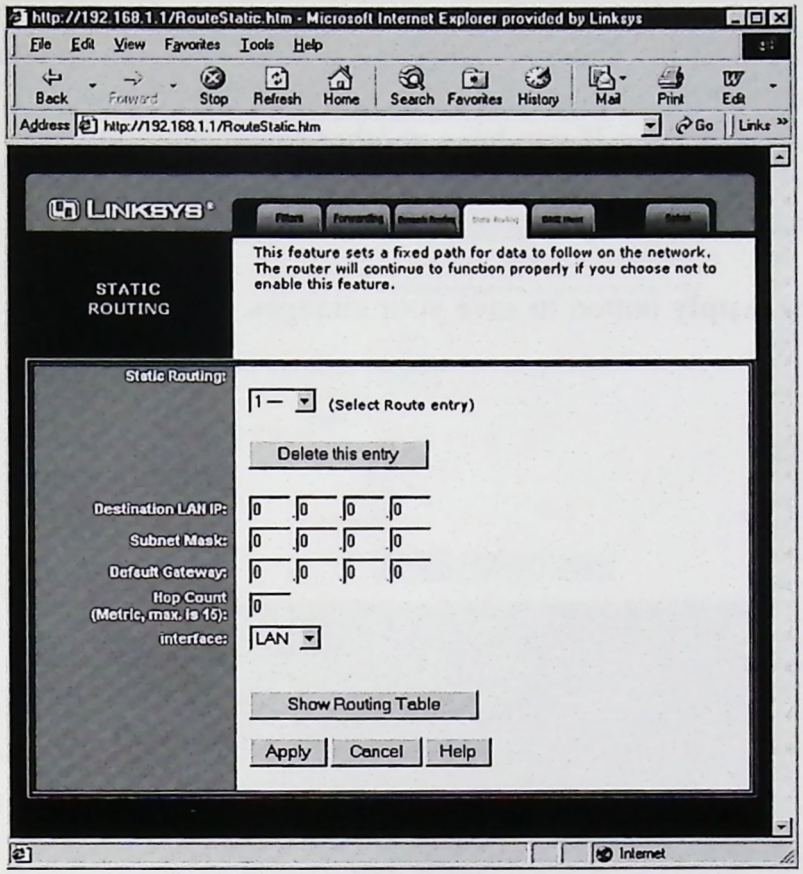
1. Choose the correct working mode. **Gateway Mode** should be used if your Linksys router is hosting your network's connection to the Internet. **Router Mode** should be selected if the router exists on a network with other routers.

2. Choose the **protocol** by which you transmit data on the network.

3. Choose the protocol by which the Router receives network data.

4. Click the Apply button to save your changes.

Static Routing



If there are multiple routers on your network, it is necessary to configure the unit's static routing functions. The static routing function determines your network's data paths. Use static routing to allow different IP domain users to access the Internet through your Cable/DSL Router. Click on the **Show Routing Table** button to view the current routing table.

To create a static route entry:

1. Select a **Static Route Entry** from the drop down list. The device supports up to 20 static route entries.

2. Enter the following data for the static route:

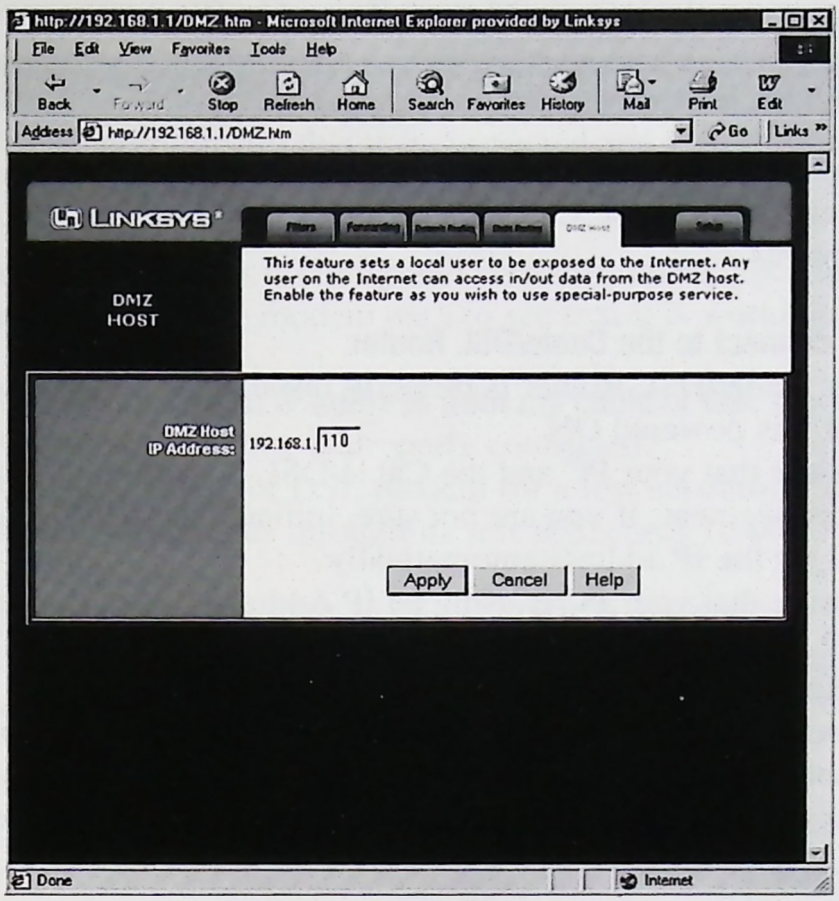
   Destination LAN IP Enter the network address of the remote LAN segment. For a standard Class C IP domain, the network address is the first 3 fields of the Destination LAN IP, while the last field should be 0.

Network Mask Enter the Subnet Mask used on the destination LAN IP domain. For Class C IP domain, the Subnet Mask is 255.255.255.0.

Gateway IP If the Linksys router is the main IP router to connect your network to the Internet, then your Gateway IP is the same IP Address as the Linksys router. If you have another router handling your network's Internet connection, enter the IP Address of your main Internet router here instead.

3. Click the **Apply** button to save your changes.

DMZ Host



The DMZ Host setting allows one local user to be exposed to the Internet to use a special-purpose service such as Internet gaming or Video-conferencing.

To expose one computer, enter the computer's IP address and click the **Apply** button. Inactivate DMZ by entering a zero (0).

Troubleshooting

Common Problems and Solutions

This chapter provides the solutions to problems occurred during the installation and operation of the Cable/DSL Router. Read below description to solve your problems.

1. I Can't connect to the Cable/DSL Router.

- The Cable/DSL Router is properly installed, LAN connections are OK, and it is powered ON.
- Ensure that your PC and the Cable/DSL Router are on the same network segment. If you are not sure, initiate the DHCP function, let the PC get the IP address automatically.
- Ensure that your PC is using an IP Address within the default range of 192.168.1.2 to 192.168.1.254 and thus compatible with the Cable/DSL Router default IP Address of 192.168.1.1
- Also, the Subnet Mask should be set to 255.255.255.0 to match the Cable/DSL Router. In the Cable/DSL Router, you can check these settings by using Control Panel-Network to check the Properties for the TCP/IP protocol.

2. The Diag LED stays lit when it shouldn't.

- The Diag LED lights up when the device is first powered up. Meantime, the system will boot up itself and check for proper operation. After finishing the checking procedure, the LED turns off to show the system is working fine. If the LED remains lit after this time, the device is not working properly. Please contact your dealer for further inspection.

3. I can't browse through the Cable/DSL Router.

- Check if both ends of the network cable and power adapter are properly connected. Check if the status LEDs on the front panel are functioning properly.
- Check the TCP/IP setup on client side. Run "winipcfg" by clicking on the Start button, then selecting Run. The PC should have an IP address of 192.168.1.xxx ("xxx" is from 2 to 254.) Subnet Mask is 255.255.255.0, default gateway IP and DNS(in "More".)
- Same as above, check the same setup values in the Status Monitor page of the Cable/DSL Router.

4. When I enter a URL or IP address, I get a time out error.

- Check if other PCs work. If they do, ensure that your workstations IP settings are correct (IP address, Subnet Mask, Default gateway and DNS)
- If the PCs are configured correctly, but still not working, check the Cable/DSL Router. Ensure that it is connected and ON. Connect to it and check its settings. (If you cannot connect to it, check the LAN and power connections.)
- If the Cable/DSL Router is configured correctly, check your Internet connection. (DSL/Cable modem etc.) to see that it is working correctly.

5. One of my PCs can't obtain an IP address from my cable or DSL modem.

- Ensure that all your cabling is properly connected.
- Power down your cable or DSL modem for a few seconds. Turn it back on. After the modem goes through its self-test, check to see if you now have an IP address.
- Ensure that your cable or DSL modem is DHCP-capable.
- You may have to enter the router or host name in the setup page of the Router's web-based utility. Go to page 15 for more information.

Frequently Asked Questions

What is the maximum number of IP addresses that the Cable/DSL Router will support? The Router will support to 253 IP addresses.

Where is the Cable/DSL Router installed on the network? In a typical environment, the Router is installed between the Cable/DSL Modem and the LAN. Plug the Cable/DSL Router into the Cable/DSL Modem's Ethernet port.

Does the Cable/DSL Router support IPX or AppleTalk? No. TCP/IP is the only protocol standard for the Internet and has become the global standard for communications. IPX, a NetWare communications protocol used only to route messages from one node to another, and AppleTalk, a communications protocol used on Apple and Macintosh networks, can be used from LAN to LAN connections, but those protocols cannot connect from WAN to LAN.

Does the WAN connection of the Cable/DSL Router support 100Mb Ethernet? Because of the speed limitations of broadband Internet connections, the Cable/DSL Router's current hardware design supports 10Mb Ethernet on its WAN port. It does, of course, support 100Mbps over in the auto-sensing Fast Ethernet 10/100 switch on the LAN side of the router.

What is Network Address Translation and what is it used for? Network Address Translation (NAT) translates multiple IP addresses on the private LAN to one public address that is sent out to the Internet. This adds a level of security since the address of a PC connected to the private LAN is never transmitted on the Internet. Furthermore, NAT allows the Cable/DSL Router to be used with low cost Internet accounts, such as DSL or cable modems, where only one TCP/IP address is provided by the ISP. The user may have many private addresses behind this single address provided by the ISP.

Does the Cable/DSL Router support any operating system other than Windows 95, Windows 98, Windows 2000, or Windows NT? Yes, but Linksys does not, at this time, provide technical support for setup, configuration or troubleshooting of any non-Windows operating systems.

Appendix

How to Ping Your ISP's E-mail & Web Addresses

If your ISP's E-mail and Web addresses are configured with single words ("www", "e-mail", "home", "pop3", etc.) rather than whole Internet Addresses ("www.linksys.com", "pop3.mail.linksys.com", etc.), you can determine the IP address of those servers by "pinging" them. You will need these exact Internet Addresses (technically called IP Addresses) if you want to retrieve your e-mail or access your Internet home page while connected to the Internet through the Cable/DSL Router.

If you don't have your ISP's web and e-mail IP Addresses, you *must* either get them from your ISP or follow these steps *prior* to connecting your Cable/DSL Router to your network.

To acquire the actual IP Addresses of your e-mail server and web server:

1. **Power on the computer and the cable modem**, and restore the network configuration set by the cable modem installer if you have since changed them.

2. **Click Start**, then **Run,** and type "command". This will bring up the DOS Window.

3. **At the DOS command prompt**, type in "ping www" (assuming that your web connection or Web Browser's home page is currently called "www"). Press **Enter**.

4. **Write down the IP address returned by the ping command**. (Ex. 24.5.116.3) This IP address is the actual IP address of your Web Server, and should be the number you type into your web browser to reach your home page.

5. **Type "ping e-mail"** (assuming that your e-mail server is currently configured as "e-mail") and press **Enter**.

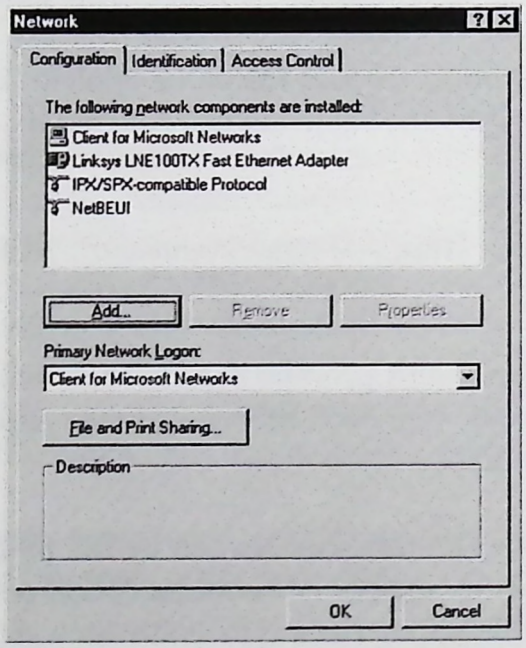
6. **Make note of this address**, as well. This address is your e-mail server's actual IP Address. In your e-mail application, you will have to replace the previous e-mail server name ("e-mail" in this case) with the actual e-mail IP Address in order to continue receiving your e-mail.

Installing the TCP/IP Protocol

Follow these instructions to install the TCP/IP Protocol on one of your PCs *only* after a network card has been successfully installed inside the PC. These instructions are for Windows 95 and Windows 98. For TCP/IP setup under Windows NT, please refer to your Windows NT manual.

1. Click the **Start** button. Choose **Settings**, then **Control Panel**.

2. Double-click the **Network** icon. Your Network window should pop up. Select the **Configuration** tab.

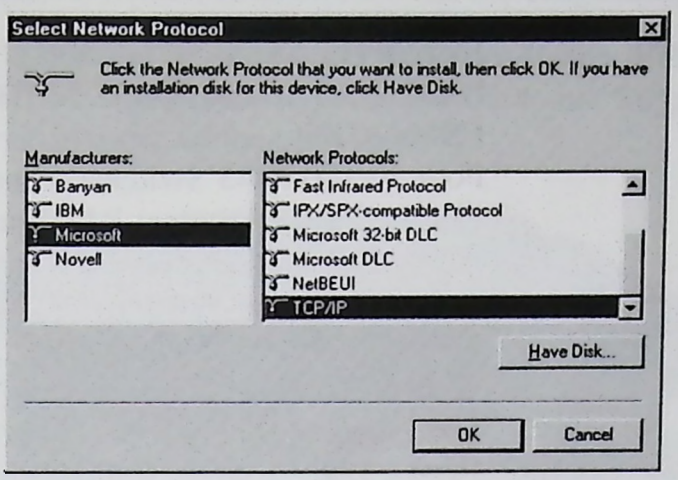


3. Click the **Add** button.

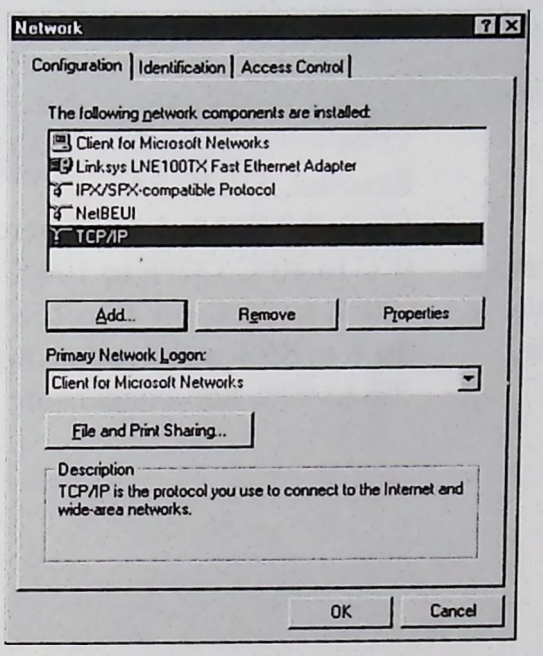
4. Double-click **Protocol**.

5. Highlight **Microsoft** under the list of manufactures.

6. Find and double-click **TCP/IP** in the list to the right (below).



7. After a few seconds you will be brought back to the main Network window. The TCP/IP Protocol should now be listed.



8. Click **OK**. Windows may ask for original Windows installation files. Supply them as needed (i.e.: D:\win98, D:\win95, c:\windows\options\cabs.)

9. Windows will ask you to restart the PC. Click **Yes**.

The TCP/IP Installation is complete.

Specifications

Model Number	BEFSR41
Standards	IEEE 802.3 10BaseT, 802.3u 100BaseTX
Protocol	CSMA/CD
Ports	Four 10/100 RJ45 Switched connectors (LAN) One 10Base-T Ethernet RJ-45 connector for ADSL/Cable Modem (WAN)
Speed	Router - 10Mbps, Switch - 10/100Mbps
Cabling Type	10BaseT: UTP/STP Category 5 100BaseTX: UTP/STP Category 5
Topology	Star
LED Indicators	Power. Link/Activity, Full Duplex/Collision, Speed for LAN. Link, Activity, Diag for WAN.

Environmental

Dimensions	142 x 236 x 46 mm (5.6 x 9.3 X 1.8 inches)
Unit Weight	12 oz
Power Input	External, 5VDC 3A
Certifications	Class B, CE Mark Commercial
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Operating Humidity	10% to 85% non-condensing
Storage Humidity	5% to 90% non-condensing

Customer Support

For help with the installation or operation of your Instant Broadband EtherFast Cable/DSL Router, contact Linksys Customer Support at one of the phone numbers or Internet addresses below.

Customer Support	800-326-7114
	949-261-1288
Fax	949-261-8868
Email	support@linksys.com
Web	http://www.linksys.com
FTP Site	ftp.linksys.com

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http://www.linksys.com

Q. What is DMZ?
A: Demilitarized Zone (DMZ) allows one IP Address (computer) to be exposed to the Internet. Some applications require multiple TCP/IP ports to be open. DMZ allows just one computer to be exposed for that purpose. It is recommended that you set your computer with a static IP if you want to use DMZ.

Q: If DMZ is used, does the exposed user share the public IP with the Router?
A: No.

Q. How can I play Internet games (i.e., Ages of Empire) and run Internet applications (i.e., NetMeeting) with the router?
A: Enable DMZ in "Advanced Features" of the web configuration screen. For example, if your computer's IP address is 192.168.1.102, enter the last three digits, or "102", in the DMZ field. You may also try using the port forwarding option instead of using DMZ.

Q: Does the Router pass PPTP packets or actively route PPTP sessions?
A: The Router lets PPTP packets pass through.

Q: What is the maximum number of users supported by the Router?
A: The router supports up to 253 users.

Q: Is the Router cross-platform compatible?
A: Any platform that supports Ethernet & TCP/IP is compatible with the router.

Q: Will the router function in a Mac environment?
A: Yes, but Linksys does not provide upgrade programs for Macintoshes. However, you may be able to find some software that uses TFTP for your Macs.

Q: Will the Router allow you to use your own public IPs and Domain, or do you have to use the IPs provided by the router?
A: The router mode allows for customization of your public IPs and Domain.

Q: How many ports can be simultaneously forwarded?
A: Theoretically, the router can establish 520 sessions at the same time, but you can only forward 10 ports.

Q: Can multiple gamers on the LAN get on one game server and play simultaneously with just one public IP address?
A: It depends on which network game or what kind of game server it is. For example, Unreal Games support multi-login with one public IP.

Q: Does the Router replace a modem? That is, is there a cable or DSL modem in the router?
A: No. The Router must work in conjunction with a cable or DSL modem.

Q: Which modems are compatible with the router?
A: The router is compatible with any cable or DSL modem that supports Ethernet.

Q: What does the User Guide mean when it says advanced features are not supported?
A: Linksys provides no phone or e-mail support for the advance features of the router.

Q: What are the advanced features of the router?
A: The router's advanced features include Filters, Forwarding, Dynamic Routing, Static Routing, and DMZ Host.

Q: What is the maximum number of VPN sessions allowed by the router?
A: At least one session.

Q: How big is the memory buffer on the router?
A: 512 Kilobytes.

Q: How do I access the router's set-up pages with a Mac?
A: The router's set-up pages are accessible to the Mac through the Mac's web browser, which must be Microsoft Internet Explorer 4.0 or higher, or Netscape Navigator 4.0 or higher. Use the default address **192.168.1.1**.

Q: Can I choose whether to use UDP or TCP on the Router's ports?
A: No, the router does not have this feature.

Q: Does Linksys provide syslog support?
A: At this time, Linksys does not support syslog.

Q: How can I check whether I have static or DHCP (dynamic) IP addresses?
A: Consult your ISP to confirm this information.

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Instant Broadband Series
EtherFast Cable/DSL Router
Model No.: BEFSR41
Visit our website at www. linksys.com.

FAQs

Below are the most frequently asked questions as compiled by the Linksys technical support team. Please consult this sheet before contacting Technical Support. The easy solution to your problem may very well be here.

Q: Does the Router support PPP over Ethernet (PPPoE)?

A: Yes, the router does support PPPoE. The router must have a firmware revision 1.20 or later for PPPoE support. To setup PPPoE support:

1. Reach the web-based administrative utility by typing "http://192.168.1.1" in your web browser's address line. Press **Enter**.
2. A Password window will appear. Type "admin" in the password box and leave the user line blank.
2. Click **Enabled** for the PPPoE option and enter the *User Name* and *Password* as provided by your Internet Service Provider (ISP). Click **Apply**, then click **Continue**.
3. Click on the **Status** tab. Scroll down the page. Ensure that PPPoE is *Enabled* and that its status is *Connect*.

Q: Why does the Router not obtain the IP address assigned by my ISP?

A: **1.** Make sure that your cable or DSL modem is connected properly.

2. Try resetting your cable or DSL modem by powering the modem off and on.

3. If you are using dynamic IP addressing, make sure that your cable or DSL modem is DHCP-capable.

4. Some ISPs require a MAC address to be registered with them.

Q: If all else fails in the installation, what can I do?

A: 1. Reset your cable modem or DSL modem by powering the unit off and on.

2. Obtain the latest release of firmware on the Linksys website, **www.linksys.com**.

3. Reset the Router's factory default by holding down the reset button for at least 3 seconds.

4. Flash the firmware again to the Router, to ensure that it was successfully written to the unit.

Q: How will I be notified of new router firmware upgrades?

A: All Linksys firmware upgrades are posted on the Linksys website at **www.linksys.com**, where they can be downloaded for free. The router's firmware can be upgraded with TFTP programs.

Q. Does the Router support IPSEC?

A: No. IPSEC is a security protocol that provides authentication and encryption over the Internet. Unlike SSL, which provides services at layer 4 and secures two applications, IPSEC works at layer 3 and secures everything in the network.

Q. What is NAT?

A: Network Address Translation (NAT) translates multiple IP addresses on the private LAN to one public address that is sent out to the Internet. This adds a level of security, because the address of a PC connected to the private LAN is never transmitted to the Internet. Furthermore, NAT allows the Cable/DSL Router to be used with low-cost Internet accounts, such as DSL or cable modems, where only one TCP/IP address is provided by the ISP. The user may have many private addresses behind the single address provided by the ISP.

Q: What type of firewall is the router equipped with?

A: The Router uses NAT and TCP/IP port inspections.

Q: Does the Router do Stateful packet inspection?

A: No.

Q. I am not able to get my e-mails or my ISP web page (e.g., http://www.isp.com/). What can I do?

A: Contact the ISP to get the full URL, or you can do the following:

1. Connect one of the computers directly to the cable modem or DSL modem.
2. Open a command prompt and ping the ISP web server or mail server name given. For example, at the command prompt, type in **ping www**, and then press **Enter**. You should be able to get an IP address when it responds.
3. After you get the IP address, enter the IP address on the mail server option.

Q. I am not able to get the web configuration screen for the router. What can I do?

A: You may have to remove proxy settings on your Internet browser, e.g., Netscape or Internet Explorer. Or, remove the dial-up settings on your browser.

Continued on back...

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	Model No.	Product Description
EtherFast 10/100 LAN Card	LNE100TX*	EtherFast 10/100 LAN Card; Auto-Sensing 10/100 port, 32-bit PCI Bus
EtherFast II 10/100 LAN Card	LNE200TX*	EtherFast II 10/100 LAN Card; Auto-Sensing 10/100 port, 32-bit PCI Bus
EtherFast 10/100 PCMCIA Cards	PCMPC100	EtherFast 10/100 PCMCIA Card; Auto-Sensing 10/100 port, Full Duplex
	PCMPC200	EtherFast 10/100 Card-Bus PC Card; Auto-Sensing 10/100 port, Full Duplex
	PCM100	EtherFast 10/100 Integrated PC Card
	PCM200	EtherFast 10/100 Integrated Card-Bus PC Card
	PCMLM56	EtherFast 10/100 56K LANmodem PC Card (PCMLM56)
EtherFast 10/100 Hubs	EFAH05W	EtherFast 5-Port 10/100 Auto-Sensing Desktop Hub; uplink port
	EFAH08W	EtherFast 8-Port 10/100 Auto-Sensing Desktop Hub; uplink port
	EFAH16W	EtherFast 16-Port 10/100 Auto-Sensing Desktop Hub; uplink port
	EFAH16**	EtherFast 16-Port 10/100 Auto-Sensing Rackmount Hub; uplink port
	EFAH24**	EtherFast 24-Port 10/100 Auto-Sensing Rackmount Hub; uplink port
StackPro II 10/100 Managed Hubs	DSHUB16**	StackPro II 10/100 Dual-Speed 16-Port Hub; stackable; cable included
	DSHUB24**	StackPro II 10/100 Dual-Speed 24-Port Hub; stackable; cable included
EtherFast 10/100 Switches	EZXS55W	EtherFast 5-Port 10/100 Auto-Sensing Desktop Switch; Full Duplex
	EZXS88W	EtherFast 8-Port 10/100 Auto-Sensing Desktop Switch; Full Duplex
	EZXS88R	EtherFast 8-Port 10/100 Auto-Sensing Rackmount Switch; Full Duplex
EtherFast II 10/100 Switches	EFS16	EtherFast II 10/100 16-Port Switch
	EFS24	EtherFast II 10/100 24-Port Switch
	EFS24M	EtherFast II 10/100 Managed 24-Port Giga Switch
	EFS24MG	EtherFast II 10/100 Gigabit Switch Module
EtherFast 10/100 Switcheswith Fiber Options	DSSX12**	EtherFast 12-Port 10/100 Auto-Sensing Switch
	DSSX16**	EtherFast 16-Port 10/100 Auto-Sensing Switch
	DSSX24**	EtherFast 24-Port 10/100 Auto-Sensing Switch
EtherFast 10/100 Expandable Switch	DSSX16E***	EtherFast 16-Port 10/100 Auto-Sensing Expandable Switch
EtherFast 10/100 PrintServers	PPSX1	EtherFast 1-Port PrintServer; 1 10/100 RJ-45 Port, 1 Parallel Port (Bi-Directional)
	EPXS3	EtherFast 3-Port PrintServer; 3 10/100 RJ-45 Port, 3 Parallel Ports (Bi-Directional)
	EFSP42	EtherFast 10/100 4-Port Switch with 2-Port 10/100 PrintServer
EtherFast 10/100 Internet Sharing Routers	EFROU44	EtherFast 10/100 4-Port Analog Router
	BEFSR41	EtherFast 10/100 4-Port Switch with Broadband Router
Ethernet 10Base/T Network Adapters	LNE2000*	Ether16 Combo LAN Card; NE2000 (ISA); BNC/RJ-45 ports
	LNE2000T	Ether16 10BaseT LAN Card; NE2000 (ISA); RJ-45 port
	LNEPCI2	EtherPCI Combo LAN Card II; 32-bit PCI, BNC/RJ-45 ports
	LNEPCI2T	EtherPCI 10BaseT LAN Card II; 32-bit PCI, RJ-45 port
	EC2T	Combo PCMCIA Ethernet Card; BNC/RJ-45 ports
Ethernet 10BaseT Hubs	EW5HUB	Ethernet 5-Port Workgroup Hub; uplink port
	EWHUB	Ethernet 8-Port Workgroup Hub; uplink port & BNC Port
	EW10HUB	Ethernet 10-Port Workgroup Hub; uplink port & BNC Port
	EW20HUB	Ethernet 20-Port Workgroup Hub uplink port & BNC Port
	EEHUB16	Ethernet 16-Port Enterprise Hub, BNC & AUI Ports
Network Starter Kits (100BaseTX & 10BaseT)	FESWSK5	EtherFast 10/100 Switched Network in a Box; 2 LNE100TX, 1 EZXS55W
	FENSK05	EtherFast 10/100 Network in a Box; 2 LNE100TX, 1 EFAH05W
	EW5PCISK	Network Starter kit; 2 LNEPCI2, 1 EW5HUB
USB Series	USB10T	USB Network Adapter; USB to 10BaseT Networks
	USB100TX	EtherFast 10/100 USB Network Adapter
	USBHUB04	USB 4-Port Hub; 4 USB ports
Home PhoneLine Series	HPN100	HomeLink Phoneline Network Card; 1 RJ-45 Port & 2 RJ-11 Ports, cable
	HPN100SK	HomeLink Phoneline Network in a Box; 2 HPN100, 2 phone cables
	USB100H1	HomeLink Phoneline + 10/100 USB Network Adapter
	HPES03	HomeLink Broadband Network Bridge
	PCM100H1	HomeLink Phoneline + 10/100 Network PC Card
	HPN200	HomeLink Phoneline 10M Network Card
	HPN200SK	HomeLink Phoneline 10M Network in a Box
KVM Switch Series	PS2KVM2	ProConnect 2-Port Compact KVM Switch (PS/2)
	PS2KVM4	ProConnect 4-Port KVM Switch (PS/2)
	PS2KVMSK	ProConnect 2-Port Compackt KVM Switch Kit (PS/2) with cables
	SVIEW02	ProConnect 2-Port KVM Switch; Keyboard, Monitor, Mouse for 2 PC's
	SVIEW04	ProConnect 4-Port KVM Switch; Keyboard, Monitor, Mouse for 4 PC's
	KVM100SK	ProConnect 2-Port KVM Switch Kit with cables
Network Attached Storage (NAS)	EFG20	EtherFast 10/100 Instant GigaDrive (20GB)

* Product available in multiple packs
LNE100TX = single, 5, 10, 20, 60, 100 packs
LNE200TX = single, 5, 10, 20, 60, 100 packs
LNE2000 = single, 6, 10 packs
** Fiber options avaible (Please inquire)
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Instant EtherFast Series

Cable/DSL Router

Model No.: BEFSR41

Quick Installation

This sheet will guide you through the basic steps needed to install the Cable/DSL Router onto your network. If you have any problems during installation, refer to the **Troubleshooting** section of the **User Guide**.

Preliminary Information

You will need the following values from your ISP to install the Cable/DSL Router (if the information is applicable).

- Your broadband-configured PC's fixed Internet IP Address
- Your broadband-configured PC's Computer and Workgroup Names
- Your Subnet Mask
- Your Default Gateway
- Your ISP's DNS IP Address

Installing Your EtherFast Cable/DSL Router Onto Your Network

1. **Power everything down**, including your **PCs**, **cable** or **DSL** modem, and the **Router**.

2. **Connect a network cable** from one of your PCs' Ethernet ports to one of the LAN Ports on the back of the Router. Do the same with all the PCs you wish to connect to the Router. (LAN Port 1 will become inactive if you use the Uplink port.)

3. **Connect the network cable** from your broadband modem to the **WAN** port on the rear of the Router. (The WAN Port is the upside-down port.)

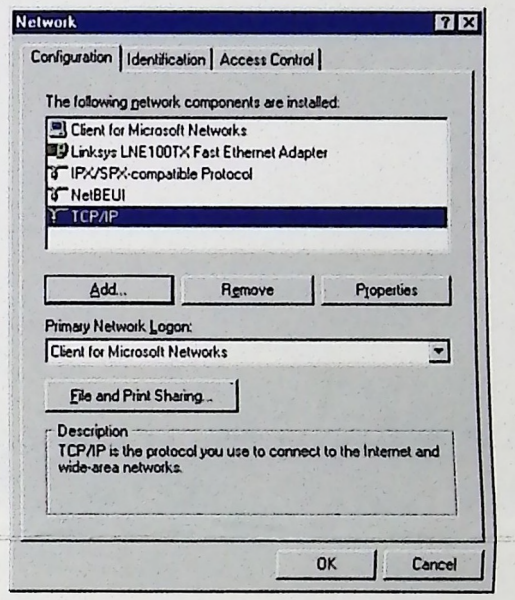
4. **Connect the power-supply cable** to the **Power** port on the rear of the router, then connect to a power outlet using the power cord included in the router's packaging.
   - The **Power LED** will illuminate green as soon as the power adapter is connected.
   - The **Diag LED** will illuminate red for a few seconds while the Router goes through its internal diagnostic test. The LED will turn off when the self-test is complete.

5. **Press the Reset button** on the front of the router. Hold the button in for three seconds, or until the Diag LED illuminates red. This restores the router's default settings.

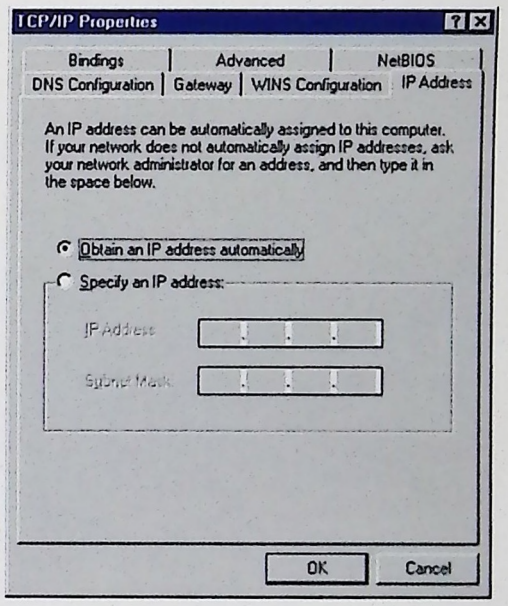
6. Power on one of your PCs and login if you are asked to. When you reach the desktop, click the **Start** button, select **Settings**, then select **Control Panel**.

7. Double-click the **Network** icon.
8. In the *Configuration* window, highlight the **TCP/IP** that has been associated with your network card or adapter. (Do *NOT* configure **TCP/IP->Dial-up Adapter**.) Click **Properties**. If the TCP/IP Protocol isn't listed in the Configuration window, go to page 30 of the User Guide now.

> ***Note**: Steps 8-10 will only work in Windows 95 and Windows 98. If you are using Windows NT, please check your Windows NT documentation to configure your TCP/IP protocol.*



9. Click the **IP Address** tab. Select *Obtain an IP address automatically*. Click **OK**.



10. Click **OK** again. Windows may begin copying files to your computer, and then will ask you to restart your PC. Click **Yes** to restart your computer and initiate the new settings. If you aren't asked, manually restart the computer.

11. Open your PC's web browser and type *http://192.168.1.1* in

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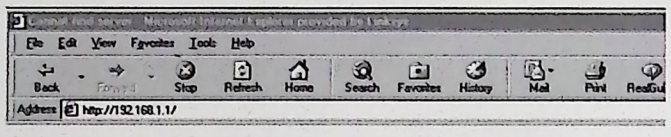
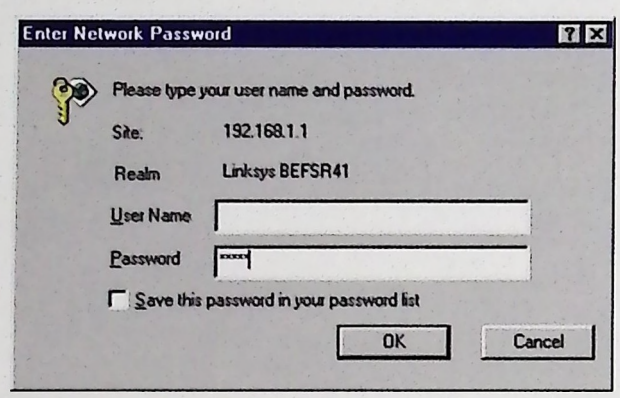
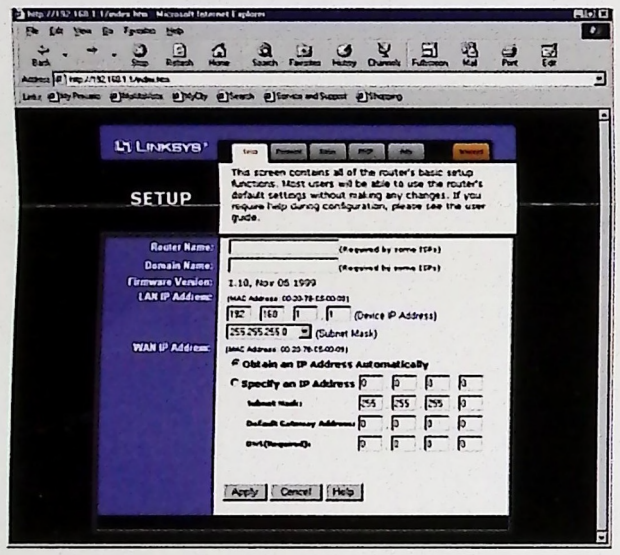
the browser's Address box. Press **Enter**.



12. A username and password prompt will appear. **Leave the User Name box empty** and type "admin" (the default password) in the Password box. Click **OK**.



13. Configure the following values into the *Cable/DSL Router's Setup page*. You can get these values from your ISP. (*Not everyone will require the following settings. Check with your ISP.*)



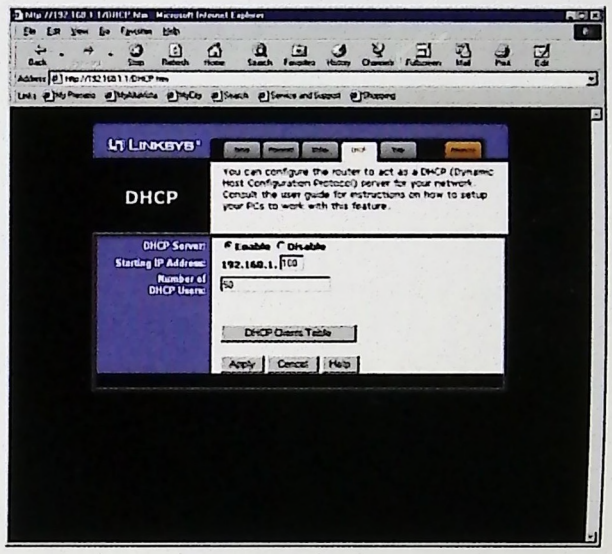
LAN IP Address These values refer to the internal network you are creating with your Cable/DSL Router. Unless you have specific internal needs, there should be no reason to change these values.

WAN IP Address These values refer to the outside network you connect to every time you access your Broadband Internet connection. Most Broadband ISPs assign their clients with a different IP address each time they log on. If this is the case with your ISP, click **Obtain an IP Address Automatically** and continue on to step 14. If your PC has been assigned a fixed IP address by your ISP, click **Specify an IP Address** then enter address into the **Subnet Mask, Default Gateway Address and DNS** fields.

> ***Note**: Check with your ISP to see if you need to enter **Router & Domain Names** to be viewed by your ISP's network. If you do, click on your **Start** button. Choose **Control Panel**, then double-click the **Network** icon. Choose the **Identification** tab. There will be a **Computer Name** and a **Workgroup** name displayed here. Enter the **Computer Name** into the **Router Name** box on the* Setup Page, *and enter the **Workgroup** name into the **Domain Name** box on the* Setup Page.

14. When you have properly configured the Setup page, click on the **Apply** button. Click **Continue**.

15. Choose the **DHCP** tab.



16. Unless you already have a DHCP server on your internal network, choose **Enable** from the *DHCP Server* field.

17. In the *Number of DHCP Users* box, enter the **number of PCs** you plan on networking to the Router, then click **Apply**.

18. Click the **Continue** button, then close your web browser. Restart your computer to apply the new settings.

19. **Before your PC reboots**, power down your broadband modem for three seconds, then power it back on.

20. **After your PC reboots,** open your web browser to test your Internet connection.

21. **Repeat steps 6-10** as necessary for each PC on your network.

Once you have configured all of the PCs on your network, the Cable/DSL Router Setup and Installation is complete.